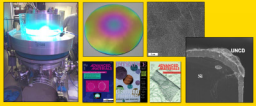
Argonne's Ultrananocrystalline Diamond (UNCD) Film Technology: *A New Model for Tech Transfer*

Argonne NATIONAL LABORATORY

What Is Ultrananocrystalline Diamond?



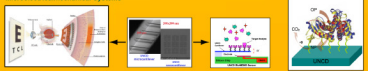
UNCD captures most of the properties of natural diamond, and in addition:

- **It's smooth as deposited, independent of thickness**
- **Can be made highly electrically conductive at RT (metallic diamond)**
- **Can be deposited at 350-400ºC at deposition rates suitable for fabrication of commercial devices**
- **Has low as-deposited stress (but not tunable or tensile)**
- **Ar-rich plasma process more scalable, safer, lower energy than conventional H-rich plasmas used by everybody else**

UNCD Applications

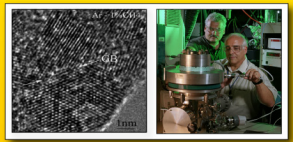
Mechanical Pump Seals

MEMS
Microelectricalmechanical Systems



Biomaterials
Implantable Biomedical Devices — Biosensors

World-Class Basic Research



Novel Tech-Transfer Model

ADVANCED DIAMOND TECHNOLOGIES, INC.
WWW.THINDIAMOND.COM

Platform Technology with High Societal Impact

Energy Savings

Telecommunications

Biomedical Implants

How to Best Commercialize the UNCD technology?

- **Argonne elected to form a start-up: Advanced Diamond Technologies, Inc. (Neil Kane, CEO, www.thindiamond.com)**
  - *John Carlisle, Orlando Auciello co-founders*

Founders and Argonne hold equity position in the company. It took 18 months to do this:

- *Licensing patents*
- *DOE, University of Chicago, Argonne management approval*

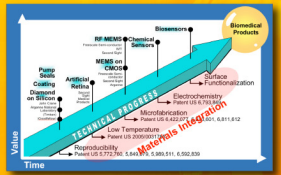
Conflict of Interest (COI)

- *Managed COI—enable founding scientists to help company yet continue to push the fundamental science through consulting by O. Auciello (Senior Scientist at Argonne)*
- *John Carlisle 50% Argonne/50% ADT*

DOE EERE Case Study

Other Argonne-developed technologies following the ADT model

- *Univa (grid computing)*
- *Cold Core therapeutics (ice slurry trauma treatment)*
- *Akonni (biochip application to point-of-care diagnostics)*



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